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PATENT SPECIFICATION

DRAWINGS ATTACHED

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International Classification:—B65b.

COMPLETE SPECIFICATION

Improvements in Packaging Apparatus

We, ROSE BROTHERS (GAINSBOROUGH) LIMITED, a British Company, of Albion Works, Gainsborough, in the County of Lincoln, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to packaging apparatus, and more particularly to apparatus for feeding sheets of stiff paper, card or the like to the open pockets of an intermittently movable pocketed chain conveyor in such apparatus. In this kind of apparatus (hereinafter referred to as the "kind described") the sheets are withdrawn from the base of a stack by a pair of reciprocating grippers (usually assisted by a pivoted suction member that deflects the forward portion of the leading sheet in the stack into the path of movement of the grippers) that position the successive sheets over successive pockets of the conveyor during its periodic rest periods, the sheets being supported on a platform formed with an aperture with which each pocket registers as it comes to rest, each sheet being pressed through the aperture into a waiting pocket by a reciprocating plunger, such action causing the sheet to be folded into U-shape with the legs of the "U" upstanding from the pocket.

With some kinds of sheet, particularly sheets of corrugated paper board, there is a tendency for the folded sheet to lift from the pocket upon withdrawal of the plunger with the result that the sheet tends to get jammed in the working parts of the apparatus during subsequent movements of the conveyor. It is with this difficulty that the present invention is concerned.

According to the present invention, there is provided an apparatus of the kind described, comprising a pair of fingers pivotally mounted

on the plunger and yieldably urged (e.g., by spring means) towards opposite sides of the pockets so as to press the upstanding sides of the folded sheet outwardly beyond the edges of the aperture as they pass through the aperture and to maintain them in that position during initial withdrawing movement of the plunger. By these means, in the event that the folded sheet tends to rise as the plunger is withdrawn, the upper edges of the upstanding sides of the sheet will abut the lower surface of the supporting platform adjacent the edges of the aperture, thus preventing further upward movement of the folded sheet.

Limit stops are preferably provided for the fingers to determine the limit of their outward movement, such stops conveniently being adjustable to deal with pockets of different width.

In order to allow free passage of the upstanding sides of the folded sheet past the lower surface of the platform there will normally be a gap between those sides and that surface, and in case any sheet is lifted by the plunger to the extent allowed by the gap, there is preferably associated with the plunger a presser plate moving with the plunger and extending over the pocket in advance of the one into which the plunger descends, the presser plate being arranged at a level (in its lowermost position) corresponding to the normal level of the upper edges of the folded sheet so as to press back into position any folded sheet not properly seated in its pocket.

The invention has been found particularly useful as applied to the feeding of liner sheets of corrugated paper to the pockets of the feed conveyor in a bottle-cartonning machine, and by way of example, the invention will now be described in greater detail with reference to the accompanying diagrammatic drawings, as applied to such a purpose.

[Price 4s. 6d.]

In the drawings:—

Figure 1 is an elevation of part of a bottle-cartonning machine,

Figure 2 is a sectional elevation, to a larger scale, of a detail of Figure 1, and

Figure 3 is a sectional view on the line 3—3 in Figure 2.

Sheets 11 of corrugated paper are withdrawn in succession from a magazine 12 by a gripper device 13 mounted on a carriage 14 provided with rollers 16 by which the carriage is movably mounted on a slide bar 17, the carriage being reciprocated by a cam-operated link 18. The gripper device is assisted by a pivoted suction member 19 oscillated in timed relationship with the carriage 14 by a cam-operated link 21. The suction member 19 deflects the forward portion of the leading sheet 11 in the magazine into the path of movement of the gripper device 13. The upper jaw 22 of the gripper device 13 is pivoted at 23 and formed with an arm 24 carrying a roller 26 spring-urged towards a track 27 mounted for vertical reciprocation in a bracket 28 and arranged to be actuated by cam and link mechanism 29, the latter operating to open the jaw 22 during the approach of the carriage 14 to the magazine 12, and to allow the jaw 22 to close under the action of its spring during the retracting movement.

As each sheet 11 is withdrawn from the magazine 12, it is drawn by the gripper device 13 along a supporting platform 31 and positioned over an aperture 32 in the platform 31. Arranged below the platform 31 is a chain conveyor 33 having open-topped pockets 34, the conveyor being movable intermittently to carry each pocket 34 into register with the aperture 32 in readiness to receive the sheet 11.

As the sheet 11 is released by the jaw 22 and during a rest period of the conveyor 33 with a pocket 34 in register with the aperture 32, a reciprocating plunger 36 is operated to press the sheet 11 through the aperture 32 and into the waiting pocket 34 in the form of a "U" with portions upstanding from the pocket. The plunger 36 extends laterally over the conveyor 33 from a bracket 37 attached to a slide bar 38 connected by a link 39 to a cam-actuated arm 40 operated in synchronism with the conveyor 33 and gripper device 13.

Pivotaly mounted in bearing brackets 41 secured to the plunger 36 is a pair of fingers 42 urged outwardly by a common spring 43 passing through a suitable aperture in the plunger body. Adjustable stops limit the outward movement of the fingers 42. The

upper tips of the fingers 42 are turned outwardly to engage the upper edges of the sheets 11 as they are formed into "U"-shape by the passage through the aperture 32. The upstanding sides of the folded sheet 11 are urged outwardly by the fingers 42 so as to pass beyond the lower edges of the aperture 32 as they pass through the aperture, the platform 31 being formed with suitable slots 44 for the passage of the outwardly turned portions of the fingers.

In the event that the folded sheet 11 tends to rise with the plunger 36 as the latter is withdrawn, therefore, the upper edges of the upstanding sides of the sheet will abut the lower surface of the platform 31 adjacent the edges of the aperture 32, thus preventing upward movement of the folded sheet; and in order to avoid interference between any sheet that has been so lifted and the lower surface of the platform 31 during movement of the conveyor 33 there is attached to the plunger 36 a presser plate 46 extending over the pocket 34 in advance of the one in register with the plunger, the presser plate 46 being arranged at a level (in its lowermost position) corresponding to the normal level of the upper edges of the folded sheet 11 so as to press back into position any sheet not properly seated in its pocket.

WHAT WE CLAIM IS:—

1. Packaging apparatus of the kind described comprising a pair of fingers pivotaly mounted on the plunger and yieldably urged towards opposite sides of the pockets so as to press the upstanding sides of the folded sheet outwardly beyond the edges of the aperture as they pass through the aperture and to maintain them in that position during initial withdrawing movement of the plunger.

2. Apparatus as in Claim 1, comprising limit stops to determine the limit of the outward movement of the fingers.

3. Apparatus as in Claim 2, wherein the stops are adjustable.

4. Apparatus as in any of the preceding claims, comprising a presser plate attached to the plunger and extending over the pocket in advance of the one into which the plunger descends, the presser plate being arranged at a level (in its lowermost position) corresponding to the normal level of the upper edges of the folded sheet.

5. Packaging apparatus substantially as described with reference to the accompanying drawings.

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale*

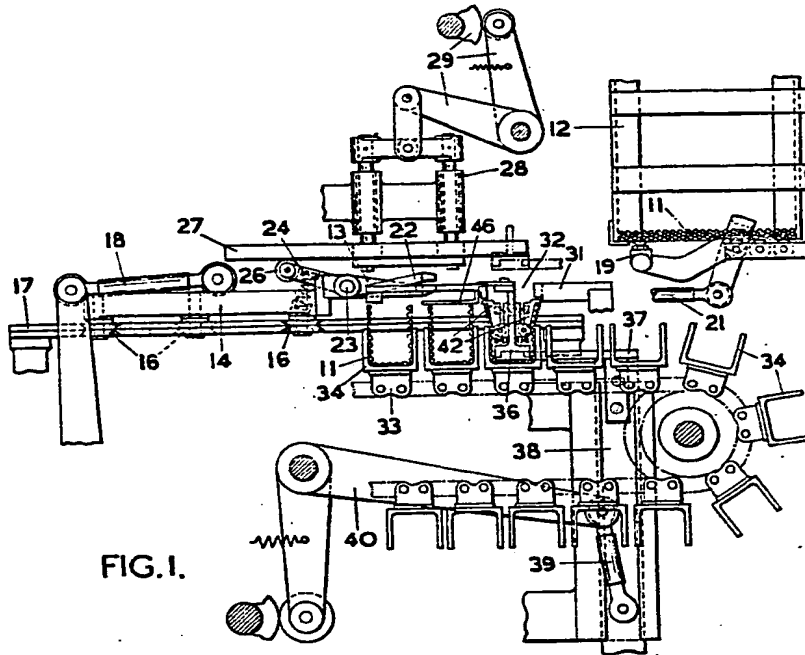


FIG. 1.

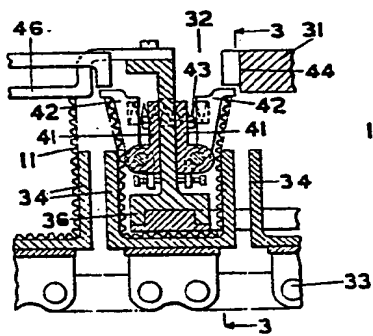


FIG. 2.

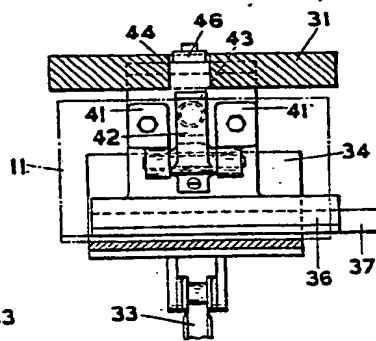


FIG. 3.

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